PALM INTRANET

Day : Friday
Date: 2/4/2005
Time: 12:03:53

Inventor Information for 09/759487

Inventor Name	City	State/Country
KOHLER, ROBERT	MILL VALLEY	CALIFORNIA
FORD, PATRICK	ALAMEDA	CALIFORNIA

Appln Info | Contents | Petition Info | Atty/Agent Info | Continuity Data | Foreign Data | Inventor

Search Another: Application# [ ] Search **or Patent#** [ ] Search

PCT / [ ] / [ ] Search **or PG PUBS #** [ ] Search

Attorney Docket # [ ] Search

Bar Code # [ ] Search

To go back use Back button on your browser toolbar.

Back to PALM | ASSIGNMENT | OASIS | Home page

Checked
ERC
2-4-05

h e eb cg b e e f e

PALM INTRANET

Day : Friday
Date: 2/4/2005
Time: 12:03:25

Continuity Information for 09/759487

Parent Data

09759487

Claims Priority from Provisional Application 60176109

Claims Priority from Provisional Application 60186954

Child Data

No Child Data

Appln Info | Contents | Petition Info | Atty/Agent Info | **Continuity Data** | Foreign Data | Inventors | Add

Search Another: Application# [ ] Search **or Patent#** [ ] Search

PCT / [ ] / [ ] Search **or PG PUBS #** [ ] Search

Attorney Docket # [ ] Search

Bar Code # [ ] Search

To go back use Back button on your browser toolbar.

Back to PALM | ASSIGNMENT | OASIS | Home page

Checked
ERC
2-4-05

h e eb cg b e c

US-PAT-NO: 5331118
DOCUMENT-IDENTIFIER: US 5331118 A
TITLE: Package dimensional volume and weight determination system for conveyors
DATE-ISSUED: July 19, 1994
INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Jensen; Soren	Duxbury	MA	02332	N/A

US-CL-CURRENT: 177/25.14, 177/245 , 33/1V , 33/121 , 702/166 , 702/170

ABSTRACT: A method and system for determining the dimensional volume of a package by moving the package on a conveyor belt system over a horizontally disposed strip containing machine-readable indicia indicating units of incremental length along said strip starting from a zero point and by a vertically disposed strip containing machine-readable indicia indicating units of incremental length along said strip starting from a zero point, with a horizontally disposed reader above the horizontally disposed strip to read the uncovered indicia on the horizontally disposed strip and a vertically disposed reader able to read the uncovered indicia on the vertically disposed strip with a computer to determine the lowest uncovered incremental length measurement of the indicia on tile horizontally disposed strip, such measurement being tile width of tile package and the lowest uncovered incremental length measurement of tile indicia on tile vertically disposed strip, such measurement being tile height of tile package, and a device to measure tile package's length as it moves on the conveyor belt system such that the computer calculates tile package's dimensional volume by taking tile product of tile measurements for the length, tile height and tile width of the package. A weigh-in-motion scale is utilized on the conveyor belt system, the output of which is also directed to the computer to calculate tile package's dimensional weight.
18 Claims, 3 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 2

---------- KWIC ---------

Abstract Text - ABTX (1): A method and system for determining the dimensional volume of a package by moving the package on a conveyor belt system over a horizontally disposed strip containing machine-readable indicia indicating units of incremental length along said strip starting from a zero point and by a vertically disposed strip containing machine-readable indicia indicating units of incremental length along said strip starting from a zero point, with a horizontally disposed reader above the horizontally disposed strip to read the uncovered indicia on the horizontally disposed strip and a vertically disposed reader able to read the uncovered indicia on the vertically disposed strip with a computer to determine the lowest uncovered incremental length measurement of the indicia on tile horizontally disposed strip, such measurement being tile width of tile package and the lowest uncovered incremental length measurement of tile indicia on tile vertically disposed strip, such measurement being tile height of tile package, and a device to measure tile package's length as it moves on

the conveyor belt system such that the computer calculates tile package's dimensional volume by taking tile product of tile measurements for the length, tile height and tile width of the package. A weigh-in-motion scale is utilized on the conveyor belt system, the output of which is also directed to the computer to calculate tile package's dimensional weight.

TITLE - TI (1): Package dimensional volume and weight determination system for conveyors

Brief Summary Text - BSTX (3): The device and system of this invention reside in the field of systems for the determination of both weight and size dimensions of objects on conveyor belt systems and more particularly relate to an apparatus and method for dimensional volume and weight determination of packages utilizing indicia such as bar codes on measuring strips.

Brief Summary Text - BSTX (5): In the freight forwarding business, domestic and international shippers will often base delivery rates not only on the weight of a package but also on its dimensional volume which taken together are sometimes referred to as "dimensional weight." The determination of dimensional weight to calculate shipping cost has become necessary as the cost of transportation has gone up. Not only is the weight of a package a factor in cost but also the space or volume that that package occupies. Consideration of dimensional volume is especially critical in air cargo shipping where cargo space is especially limited and where weight determination alone would be an inadequate basis for calculating the value of the space taken up by a package. Dimensional volume consideration is also important in surface transportation such as truck or train service where cubicle space is limited.

Brief Summary Text - BSTX (6): Conveyor systems have been developed in the prior art which weigh packages moving along the conveyor. Also these conveyor systems can determine a package's dimensional volume for later calculation of "dimensional weight." In many cases the dimensional weight is compared to the actual cargo weight and the larger of these two amounts is used to determine shipping charges. The system which has customarily been used for high-speed dimensional volume determination passes the package along a conveyor system through a dimensioning frame where a first array of infrared lights shines down vertically and a second array of infrared lights shines across horizontally. The infrared lights are detected by sensors disposed on the opposite sides of tile frame. The infrared light beams not blocked by the package are sensed by the sensors which then indicate the dimensional characteristics of the package as it passes through tile frame. These height, length and width measurements are then directed to a computer which calculates tile dimensional volume of the package by adding each package "slice" as blocked by each beam together. The conveyor also utilizes a weigh-in-motion conveyor belt to determine individual package weight. Such infrared device systems are very costly and consequently have not been widely adopted in tile freight industry.

Brief Summary Text - BSTX (10): It is an object of this invention to provide a far less costly system than that of the prior art for determining dimensional volume of packages on conveyor lines for the determination of shipping costs therefor and shipping space requirements. The system of this invention utilizes well-known existing components, namely conveyors with bar code scanning systems thereon which scanning systems are economical and widely used in the freight industry.

Brief Summary Text - BSTX (12): It is a still further object of this invention to provide an integrated measuring system on a conveyor belt system capable of electronically acquiring information about a package's dimensions and to transmit such information to electronic data processing units for calculation of the package's dimensional volume for use in other calculations such as determination of its freight cost and/or ability to be packed within certain cargo spaces.

Brief Summary Text - BSTX (14): The invention disclosed herein includes a package dimensional volume measuring apparatus and system which determines tile length, width and height of a package or any rectangular or square-sided product as it is in motion on a conveyor belt. The system of this invention utilizes a combination of an in-feed conveyor belt metered by a pulse generator incremental length encoder in combination with a photoelectric eye which scans across the belt to detect the presence or absence of a package. The pulse generator generates a pulse for a selected incremental length of movement of the belt. When the package first breaks the photoelectric eye beam, the system starts counting the number of pulses until the package passes by the beam and the beam is re-established. The number of pulses multiplied by the selected incremental length of belt movement that occurred per pulse yields the package's length. Also included in tile system are a vertical bar code reader array and a horizontal bar code reader array to continuously read two bar-coded measuring strips, one of which is positioned on the horizontal plane beneath the carrying surface of the conveyor belt, and perpendicular to the direction of movement of the conveyor belt and can be mounted in the gap between two conveyor belts. The other bar-coded measuring strip is positioned in a vertical plane to one side of the conveyor belt and can be aligned adjacent to the horizontally positioned bar-coded measuring strip. Each of the measuring strips has indicia such as bar codes imprinted thereon which, when sensed, identify increments of length starting at a zero reference point. Those bar codes that are not covered by the package passing thereover and thereagainst identify the width and height of the package by the counting of such exposed bar codes. Prior to entering onto an infeed conveyor, the package is first skewed by the conveyor system to the zero reference point side above the horizontal measuring bar code strip and adjacent to the vertical bar code strip. In one embodiment of a measuring strip tile bar code segments can each be an ascending number, indicating an incremental length so that the smallest bar code number scanned on the horizontal bar code strip and the smallest bar code number scanned on the vertical bar code strip then indicate, respectively, the width and the height of the package. The package's length, width and height measurements can be downloaded to a computer to mathematically calculate dimensional volume of the package from the product of all three measurements. This result can be displayed on a CRT, a terminal or transmitted

to another computer system. The collection of the dimensional volume data can be used to calculate shipping charges based on weight and/or dimensional volume, for load planning or for any other purpose that one might want to collect the dimensional data of the package. The horizontal and vertical bar code reader arrays positioned opposite the bar code strips can also be used to scan any bar code(s) placed in a readable position on the package and determine whatever identifying data about the package is on such bar code(s) and also enter that information into the computer system.

Detailed Description Text - DETX (2): FIG. 1 is a perspective view showing the elements of the basic system of this invention. The direction of package flow is indicated by the arrow on infeed conveyor 10. Packages such as package 21 enter onto infeed conveyor 10 from skewed conveyor 30. Skewed conveyor 30 is a type of conveyor well known in the art which spaces packages apart from one another and also automatically skews the packages to one side of the conveyor and aligns them parallel to the direction of flow. The most commonly used type of skewed conveyor is a powerdriven live roller conveyor with skewed rollers which force the packages to one side, causing the packages to ride against fixed vertical guard 23. Instead of vertical guard 23, a powered vertical belt unit can alternately be utilized. Each package, once it is aligned on the right side of the conveyor system, as illustrated, continues onto the powered-belt infeed conveyor 10. The belt of the infeed conveyor operates at a faster speed than the speed of conveyor 30 in order to assure that a sufficient gap is provided between successive packages prior to each package's leading and trailing edges passing through the photoelectric beam detecting system as described further below. Infeed conveyor 10 is provided with an electric pulse generator 25, also known as a shaft encoder, which is mounted on the drive shaft which pulse generator/encoder is also well known in the prior art. Pulse generator/encoder 25 accurately synchronizes with the speed of infeed conveyor 10 in order to synchronize the movement of the infeed conveyor belt 10 with tile pulses which are used as inputs to count small definable increments of belt movement such as, for example, 1/2 inch of length of infeed conveyor belt movement per pulse. Infeed conveyor 10 is also combined with a weigh-in-motion conveyor scale 27, the use of which is well known in the prior art and which scale determines the weight of a package on infeed conveyor 10 since only one package is on infeed conveyor belt 10 at a time. This weight information is sent to a computer as will be described further below. At the end of infeed conveyor belt 10 is photoelectric-eye-beam producer 12 directing a detectable beam across to a photoelectric-eye-beam detector 14. Detector 14 first detects the leading edge of a package when tile leading edge interrupts such photoelectric eye beam and transmits this data to an electronic data processing unit. At the same time, pulse signals are transmitted from pulse generator 25 to an electronic data processing unit as seen in FIG. 3. The electronic data processing unit counts the pulse signals from the time when the leading edge of the package breaks the beam until the time the package advances beyond the beam. The trailing edge of the package is detected when the photoelectric-eye-beam detector 14 senses the beam again and this input is transmitted to the electronic data processing unit. Simultaneously, the pulse signal counts from the pulse generator stops, and the electronic data processing unit then calculates the length of tile package based upon tile defined incremental length of belt travel for each pulse signal

multiplied by tile number of pulse signals received during the passage of the package. This method of determining package length is well known within the materials handling industry. From infeed conveyor 10 tile package is transferred to takeaway conveyor 28. Between conveyor 28 and infeed conveyor 10, which operate at exactly the same speed, there is a small gap in which area the height and width indicia-encoded measuring strips of this invention can be located. A horizontally disposed coded measuring strip 16 is mounted between and somewhat below tile carrying surface of infeed conveyor 10 and take-away conveyor 28. On tile side to which the package has been skewed, in the case illustrated as tile right side, a vertically disposed indicia-coded measuring strip 18 is mounted. Measuring strips 16 and 18 function as machine-readable rulers and in one embodiment with fixed readable bar codes attached and placed along the length of the strip starting from the zero reference point with incremental measurements. The bar code labels can each indicate fixed increments of length above tile zero reference point, for example 1/2 inch, 1 inch, 11/2 inches, etc. The bar code symbology used can be a two-digit interleaved two of five or other established and accepted bar code symbologies or equivalent. Any remote readable indicia coding, such as radio frequency tags or character numbers which can be used with an optical character recognition system, can also be utilized. It is important that. the width of each bar code be as short as possible but that the dimension of the smallest bar or space be sufficiently large to allow for remote scanning by a bar code reader. horizontal measuring strip 16 has its zero reference point aligned exactly to the edge of the bottom package side which was first skewed toward the zero reference point of strip 16. Vertical measuring strip 18, not fully seen in FIG. 1 since part of strip 18 is behind package 26, is positioned to the right of the package. Similarly, horizontal measuring strip 16 has its zero reference point aligned to the bottom edge of the package's right side, also partially not seen in FIG. 1 as it is under the package. Each of measuring strips 16 and 18 has readable portions that extend beyond the bottom of the package and above the top of the package, respectively. A series of fixed-position moving beam laser scanners, which can be ACCU Sort Model 55, Model 30 or equivalent, are disposed in a first array above strip 16, forming a horizontal reader array 24. Another series of scanners are disposed in a second array, forming vertical reader array 20. The scanners in each array can be daisy-chained to one another and interconnected to the same decoding logic control box 44, seen in FIG. 3, which can be an ACCU Sort Model 2000 or equivalent. The scanners can also be self-contained scanner units including decode software such as computer Identics Scan Star 80 and 85 or Scan Star 15SR or equivalent and connected to each other in a slave-to-master configuration. Immediately after the leading edge of a package breaks the beam of the photoelectric-eye-beam producer 12 and moves by and over the vertical and horizontal reader arrays 20 and 24, the package covers a portion of horizontal measuring strip 16 and a portion of vertical measuring strip 18. Because the segments of such strips under and beside the package are covered, they cannot be read by the horizontal and vertical reader arrays 20 and 24, respectively, as the package passes. However, each reader array 20 and 24 can identify which indicia, such as bar codes on each strip 16 and 18, are not covered and will transmit these readings to a receiving unit such as decoder logic control box 44, seen in FIG. 3, or directly to an electronic data processing unit as will be discussed below. The receiving unit determines the lowest indicia or bar code number transmitted as the

package width read by the horizontal reader array 24 and the lowest indicia or bar code number transmitted as the height read by the vertical reader array 20. When the trailing edge of the package exits the photoelectric eye's beam, the receiving unit will stop accepting measuring data from the horizontal and vertical reader arrays. Based upon the information received, the width and height of the package are identified and the length determined by the number of pulses received from the electric pulse generator 25 during the breaking of the photoelectric beam. The processing unit in controller 48, shown in FIG. 3, can then utilize the length, width and height of the package to calculate the dimensional volume of the package. Horizontal and vertical laser scanners such as, for example, computer Identics Scan Star 80, 85 or Scan Star 15 SR or equivalent can also be used to capture information from those bar code labels, which are attached directly to packages, such as additional non-dimensional package information for the data base in the electronic data processing unit in controller 48. The calculated dimensional volume for a package is then electronically recorded and combined with the captured weight, other package information and other information already in the data base to generate a complete shipping manifest for that package. This manifest can be printed in hard copy and/or transmitted to a host computer system connected to the electronic data processor in controller 48.

Claims Text - CLTX (1): 1. A method for determining the dimensional volume of a package having sides and length, width and height on a conveyor belt having first and second side edges, comprising the steps of:

Claims Text - CLTX (15): 3. A method for determining the dimensional volume of a package having sides and a length, width and height, said package moving from a first conveyor belt to a second conveyor belt, said conveyor belts each having first and second side edges, comprising the steps of:

Claims Text - CLTX (29): 5. A system for determining the dimensional volume of a package having sides and a length, width and height, comprising:

Claims Text - CLTX (41): 7. A method for determining the dimensional volume of a package having sides and length, width and height on a conveyor belt having first and second side edges, comprising the steps of:

Claims Text - CLTX (60): 11. A method for determining the dimensional volume of a package having sides and a length, width and height, said package moving from a first conveyor belt to a second conveyor belt, said conveyor belts each having first and second side edges, comprising the steps of:

Claims Text - CLTX (79): 15. A system for determining the dimensional volume of a package having sides and a length, width and height, comprising:

US-PAT-NO: 5793652
DOCUMENT-IDENTIFIER: US 5793652 A
TITLE: Dimensional weighing apparatus
DATE-ISSUED: August 11, 1998
INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
DeBarber; Christopher	Woodbury	CT	N/A	N/A
Freeman; Gerald C.	Norwalk	CT	N/A	N/A

US-CL-CURRENT: 702/173, 702/156 , 705/401 , 705/407

ABSTRACT: A dimensional weighing apparatus is disclosed which has a weighing scale for determining the actual weight of a carton placed thereon, and associated therewith is a measuring frame having movable carton contact means for measuring the linear distance of the three axes of a carton positioned on the scale necessary to determine the volume of the carton. A computer processing means determines firstly whether the actual volume of the carton is less or greater than a predetermined threshold volume, and if greater, calculates a dimensional weight of the carton and compares the dimensional weight of the carton with the actual weight to determine which weight is the larger, and sends a signal indicative of the larger weight to a shipping system which calculates a realistic shipping charge for the carton based on the weight determined by the dimensional weighing apparatus to be the larger of the two weights.
7 Claims, 7 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 7

---------- KWIC ---------

Abstract Text - ABTX (1): A dimensional weighing apparatus is disclosed which has a weighing scale for determining the actual weight of a carton placed thereon, and associated therewith is a measuring frame having movable carton contact means for measuring the linear distance of the three axes of a carton positioned on the scale necessary to determine the volume of the carton. A computer processing means determines firstly whether the actual volume of the carton is less or greater than a predetermined threshold volume, and if greater, calculates a dimensional weight of the carton and compares the dimensional weight of the carton with the actual weight to determine which weight is the larger, and sends a signal indicative of the larger weight to a shipping system which calculates a realistic shipping charge for the carton based on the weight determined by the dimensional weighing apparatus to be the larger of the two weights.

Brief Summary Text - BSTX (13): The present invention relates generally to the concept of dimensional weighing to determine the charge required by a carrier for transporting a package or parcel, and more particularly to a dimensional weighing system suitable for use by a variety of shippers and carriers to determine accurate

freight charges for packages or parcels that are considerably oversized in comparison to their actual weight.

Brief Summary Text - BSTX (15): Briefly, the invention disclosed and claimed in that application is a dimensional weighing system in which a measuring frame has three measuring arms extending from a common juncture along the three axes of a package or parcel which must be measured to determine the volume of the parcel positioned adjacent the measuring arms with a corner of the parcel adjacent to the common juncture of the measuring arms. A plurality of optical emitters, such as LEDs, are evenly positioned along the length of the measuring arms, and either one or three optical sensors, depending on the particular embodiment of the invention, are positioned such that the sensor(s) respond to all emitters on the measuring arms that are not obscured by the parcel. By suitable electronic components, a micro computer ascertains the length of each of the dimensions of the package or parcel and calculates its volume. The computer then compares that volume with a predetermined threshold volume stored in a memory, so as to determine, firstly, whether the volume of the parcel is less than the predetermined threshold volume so that it can be shipped at a shipping charge based on the actual weight of the carton as determined by a suitable weighing scale, or is larger than the predetermined threshold volume and may therefore require that a dimensional weight be calculated on which a shipping charge is based. If the latter situation prevails, the computer then compares the dimensional weight of the carton with the actual weight to determine which is larger to ensure than the shipping charge is based on the proper weight.

Brief Summary Text - BSTX (23): In its broader aspects, the dimensional weighing apparatus of the present invention is adapted for use with a shipping system which determines an appropriate shipping charge for packages and parcels based, among other factors, on an appropriate shipping weight as determined by said dimensional weighing apparatus. Within this environment, the dimensional weighing apparatus comprises means defining a supporting surface, a weighing scale mounted on the supporting surface and having a platform on which cartons are placed for determining the actual weight of the cartons, a measuring frame operatively associated with the supporting surface, and movable means operatively associated with the measuring frame for contacting adjacent surfaces of a carton placed on the platform for measuring the linear distance of the length, width and height of the carton. There is a computer processing means responsive to operation of the weighing scale and the measuring means for determining a shipping weight of the carton by calculating the dimensional weight thereof and comparing the dimensional weight with the actual weight to determine which of these weights is the larger, whereby the dimensional weighing apparatus determines the appropriate shipping weight on which the shipping system determines an appropriate shipping charge.

Brief Summary Text - BSTX (26): The computer processing means for determining the shipping weight of a carton includes processing means for determining whether or not the volume of a carton exceeds a predetermined threshold volume below which the processing means determines a shipping weight based on the weight of the carton as

determined by the weighing scale, and at or above which the processing means calculates a shipping weight based on the volume of the carton independent of the weight thereof as determined by the weighing scale. To accomplish this, the processing means also includes a memory storage means for storing the predetermined threshold volume, memory storage means for storing the individual linear dimensions of the length, width and height of a carton disposed on the platform, means for calculating the volume of the carton based on the linear dimensions, and means for comparing the calculated volume of the carton with the predetermined threshold volume to determine which is the larger, so that the shipping system can determine an appropriate shipping charge for the carton based on that larger weight.

Brief Summary Text - BSTX (27): The processing means further includes a memory storage means for storing a dimensional weight constant in terms of cubic units per unit of weight, means for calculating a dimensional weight by dividing the actual volume of the carton by the dimensional weight constant, and means for comparing the actual weight with the calculated dimensional weight to determine which is the larger, which is the shipping weight on which the shipping system determines a shipping charge.

Detailed Description Text - DETX (17): The CPU 118 has the further capability of sending a signal indicative of that weight via a line 120 to the interface 114 and from there via a line 122 to a shipping system, designated generally by the reference numeral 124. The shipping system 124 is typically a rather complex processing system which forms no part of the present invention and therefore need not be described other than to mention that it would include a computer processing unit that would store individual carrier rates for different amounts of weight, carrier classes, destination zip codes, and other relevant information, and would respond to the incoming signal that is indicative of the shipping weight by calculating an appropriate shipping charge for the carton. It should be noted that the computer processing means 90 and all of the components contained therein could be physically located in the shipping system 124 rather than with the dimensional weighing apparatus 10. It is only necessary for complete implementation of the present invention that the computer processing means 90 be interconnected between the measuring frame 30 and the associated measuring means, on the one hand, and the shipping system 124 on the other, with the physical location of the computer processing means 90 being a matter of choice.

Detailed Description Text - DETX (25): If, on the other hand, a carton C is placed on the scale platform 24 which still weighs only 10 pounds, but the linear dimensions of this carton are, for example, 15 inches on the measuring arm 32, 23 inches on the measuring arm 34 and 12 inches on the measuring arm 36, the same procedure as described above would occur to determine the linear dimensions of the carton, except that the calculated volume of the carton would now be 4140 cubic inches, far in excess of the threshold volume of 1728 cubic inches. The CPU 118 then determines the dimensional weight of the carton, by dividing the calculated volume by the dimensional constant stored in the memory storage unit 94, which in the example is assumed to be the domestic shipping standard of 194 cubic inches per pound. The CPU 118 divides the calculated volume of 4140 cubic inches by 194, which equals 23.34 pounds, and

then compares this weight to the actual weight of the carton as determined by the scale 20 to determine which weight is the larger. In the example given, since the dimensional weight of 23.34 pounds is the larger, the CPU 118 sends a signal indicative of this weight via to the line 120 to the interface 114 and the line 122 to the shipping system 124, which then determines the shipping charge for 23.34 pounds in the same manner as it did for the smaller carton for which the actual weight was 10 pounds.

Detailed Description Text - DETX (26): If, on the other hand, the actual weight of this carton had been 25 pounds, which is relatively close to the 23.34 pounds for the dimensional weight of the carton, the CPU 118 would continue the process described above for calculating the dimensional weight of the carton in the manner described above, in which case the comparator 74 would determine that the actual weight of 25 pounds is the larger, and would then send this weight to the shipping system 124 for determination of the appropriate shipping charge.

Claims Text - CLTX (1): 1. Dimensional weighing apparatus adapted for use with a shipping system which determines an appropriate shipping charge for packages and parcels based, among other factors, on an appropriate shipping weight as determined by said dimensional weighing apparatus, said dimensional weighing apparatus comprising:

Claims Text - CLTX (11): (e) computer processing means responsive to operation of said weighing scale and said measuring means for determining a shipping weight of said carton by calculating the dimensional weight thereof and comparing said dimensional weight with said actual weight to determine which of said weights is the larger, whereby said dimensional weighing apparatus determines the appropriate shipping weight on which the shipping system determines an appropriate shipping charge.

US-PAT-NO: 5914463
DOCUMENT-IDENTIFIER: US 5914463 A
TITLE: Low cost dimensional determining system
DATE-ISSUED: June 22, 1999
INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dlugos; Daniel F.	Shelton	CT	N/A	N/A

US-CL-CURRENT: 177/25.11, 177/25.12 , 177/25.15 , 177/4

ABSTRACT: A dimensional weighing apparatus is disclosed which has a weighing scale for determining the actual weight of a carton placed thereon, and associated therewith is a measuring frame and an optical sensing system for measuring the linear distance of the three axes of carton positioned on the scale necessary to determine the volume of the carton. A computer processing means determines firstly whether the actual volume of the carton is less or greater than a predetermined threshold volume, and if greater, calculates a dimensional weight of the carton and compares the dimensional weight of the carton with the actual weight to determine which weight is the larger, and sends a signal indicative of the larger weight to a shipping system which determines an appropriate shipping charge for the carton based on the weight determined by the dimensional weighing apparatus to be the larger of the two weights.
10 Claims, 7 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 7

---------- KWIC ---------

Abstract Text - ABTX (1): A dimensional weighing apparatus is disclosed which has a weighing scale for determining the actual weight of a carton placed thereon, and associated therewith is a measuring frame and an optical sensing system for measuring the linear distance of the three axes of carton positioned on the scale necessary to determine the volume of the carton. A computer processing means determines firstly whether the actual volume of the carton is less or greater than a predetermined threshold volume, and if greater, calculates a dimensional weight of the carton and compares the dimensional weight of the carton with the actual weight to determine which weight is the larger, and sends a signal indicative of the larger weight to a shipping system which determines an appropriate shipping charge for the carton based on the weight determined by the dimensional weighing apparatus to be the larger of the two weights.

Brief Summary Text - BSTX (2): The present invention relates generally to the concept of dimensional weighing to determine the charge required by a carrier for transporting a package or parcel, and more particularly to a dimensional weighing system suitable for use by a variety of shippers and carriers to determine accurate freight charges for packages or parcels that are considerably oversized in comparison to their actual weight.

Brief Summary Text - BSTX (3): The concept of dimensional weighing has long been well known, and prior art relating to various dimensional weighing systems and apparatus has been available for over forty years. However, the concept of dimensional weighing did not receive widespread acceptance for many decades due to several reasons. One of these is that when the concept was first developed, the carriers were willing to accept freight charges based on weight as being a reasonably accurate system for determining the charge for shipping individual packages. Since the Government postal system had been determining postage charges for mail delivery based on weight since the inception of the mail system, it was only logical at the time that parcel and package carriers should do likewise. Thus, it became fairly standard in the infant industry to weigh parcels and determine freight charges according to a schedule of charges based on different weight categories. As time progressed and the distances that parcels and packages traveled became greater, a distance factor was added to the formula so that two packages having the same weight would be charged differently depending on the distance that each traveled. However, distance for any given destination from a dispatch location is the same regardless of whether a basic freight charge is based on weight or dimension.

Brief Summary Text - BSTX (4): Another reason that delayed the acceptance of the dimensional weighing concept was that at the outset there was no convenient and economic apparatus available for carrying out the dimensional weighing process. The only known method was to physically measure the three dimensions of a parcel that are necessary to determine the volume thereof using a measuring stick or tape. Although this procedure produced the end result desired for the concept of dimensional weighing, it suffered the drawbacks of being slow and tedious, thereby greatly hampering the efficient handling of large quantities of parcels, and it was only as accurate as the person performing the measuring, thereby rendering it susceptible to either over or under charging. As time passed, some forms of apparatus were developed for automatically taking the necessary measurements to determine the volume of packages, but they were generally cumbersome and difficult to operate, and sufficiently expensive that they were not cost effective in terms of the benefit derived from them.

Brief Summary Text - BSTX (8): Again, as time progressed, this disparity between the traditional weight-size relationship of the early days of private shipping began to manifest itself in lost revenue to the carriers because of the double effect of being able to transport fewer and fewer parcels and packages in a given shipment due to the increase in the unit size of parcels and packages, combined with the loss of weight which was the primary factor determining the freight charge for a parcel or package. This effect became especially severe with the development of air freight, where two opposing factors can determine whether a particular freight shipment will result in a profit or a loss to the carrier. These factors are the relatively high cost of operating an airplane to transport freight from one location to another, combined with the relatively severe limitation on the amount of space available for carrying the freight on each plane. Thus, if one plane carrying a certain volume of freight is transporting relatively heavy products on which a substantial freight payment was charged by the carrier, the operation will be profitable. If, on the other hand, the same plane carries the same

volume of freight, but the products are relatively light in weight while the cartons are large due to the quantity of shock insulating material in the carton, the freight payment charged by the carrier based on the weight will be considerably less than in the first example, with the result that the profit to the carrier will be much less, if not entirely absent.

Brief Summary Text - BSTX (9): Thus, within the last ten years or so, the carriers have come to realize that the traditional basis of weight for determining freight charges is no longer acceptable in the case of a large percentage of parcels and packages, and they have at least partially if not fully embraced the concept of dimensional weighing. And the carriers have sought to enforce shippers, both large and small, to do likewise with considerable success, with the result that the need for highly efficient, accurate and inexpensive dimensional weighing equipment is steadily increasing. As the carriers turned more and more to dimensional weighing techniques to determine freight charges for what appeared just prior to shipping to be very light packages for their size, the carriers would dimensionally weigh such packages and would assess the freight charge based on the dimension of the package rather than its actual weight, and this charge would be billed back to the shipper, who would then incur a loss of the difference between what the shipper had invoiced the receiver for the freight charge and what he was billed by the carrier based on dimensional weight. For example, if a shipper, e.g., a manufacturer, engages a carrier to transport a certain number of large cartons to various receivers, e.g., wholesale distributors, with each carton containing a certain number of relatively light, fragile products, and the shipper has invoiced each receiver for the price of the goods plus a freight charge based on the weight of each carton, the shipper receives the invoice immediately after he ships the goods. When the carrier takes possession of the cartons, he sees that they are relatively light for their size and he dimensionally weighs each carton, and thereby determines a freight charge substantially larger than that which the shipper determined based on weight and for which he invoiced the receiver. The carrier now bills the shipper for the freight charge based on dimension, but the shipper has lost his best opportunity to recoup this larger charge from the receiver, since he has already invoiced the receiver for the lesser freight charge. The shipper thus lost money on the transaction by underestimating the proper freight charge for that shipment by having initially determined the freight charge based on weight rather than dimension.

Brief Summary Text - BSTX (15): In its broader aspects, the dimensional weighing apparatus of the present invention is adapted for use with a shipping system which determines an appropriate shipping charge for packages and parcels based on an appropriate shipping weight as determined by the dimensional weighing apparatus. Within this environment, the dimensional weighing apparatus comprises means defining a supporting surface, a weighing scale mounted on the supporting surface and having a platform on which cartons are placed for determining the weight of the cartons, and a measuring frame operatively associated with the supporting surface. There is a means operatively associated with the measuring frame for measuring the linear distance of the length, width and height of a carton placed on the platform, and a computer processing means responsive to operation of the weighing scale and the measuring means for

determining a shipping weight of a carton by calculating the dimensional weight thereof and for comparing the dimensional weight with the actual weight to determine which of the weights is the larger, whereby the dimensional weighing apparatus determines the appropriate shipping weight on which the shipping system determines an appropriate shipping charge.

Brief Summary Text - BSTX (18): The computer processing means for determining the shipping weight of a carton includes a central processing unit having means for determining whether or not the volume of a carton exceeds a predetermined threshold volume below which the central processing unit determines a shipping weight based on the actual weight of the carton as determined by the weighing scale, and at or above which the dimensional weighing apparatus calculates a shipping weight based on the volume of the carton independent of the weight thereof as determined by the weighing scale. To accomplish this, the central processing unit also includes a memory storage means for storing the predetermined threshold volume, a memory storage means for storing the individual linear dimensions of the length, width and height of a carton disposed on the platform, means for calculating the volume of the carton based on the linear dimensions, and means for comparing the calculated volume of the carton with the predetermined threshold volume to determine which is the larger, so that the shipping system can determine an appropriate shipping charge for the carton based on that larger weight.

Brief Summary Text - BSTX (19): The computer processing means further includes a memory storage means for storing a dimensional weight constant in terms of cubic units per unit of weight, means for calculating a dimensional weight by dividing the actual volume of the carton by the dimensional weight constant, and means for comparing the actual weight with the calculated dimensional weight to determine which is the larger, which is the shipping weight on which the shipping system determines the appropriate shipping charge.

Brief Summary Text - BSTX (23): A still further object of the present invention is to provide a dimensional weighing apparatus which utilizes a weighing device for determining the actual weight of cartons and a measuring apparatus for measuring the length, width and height of cartons, and a computer processing unit to determine the volume thereof and to calculate a dimensional weight, and which determines a shipping weight for the cartons based on whether the actual weight or the dimensional weight is the greater, on which an appropriate shipping charge will be determined.

Detailed Description Text - DETX (13): The CPU 74 further has the capability of sending a signal indicative of that weight via the lines 76 and 78 to a shipping system, designated generally by the reference numeral 80. The shipping system 80 is typically a rather complex processing system which forms no part of the present invention and therefore need not be described other than to mention that it would include a computer processing unit that would store individual carrier rates for different amounts of weight, carrier classes, destination zip codes, and other relevant information, and would respond to the incoming signal that is indicative of the shipping weight by determining

an appropriate shipping charge for the carton. Alternatively, the length, width and height measurement data, along with other relevant data such as predetermined threshold volumes and dimensional weight constants, can, if desired, be transmitted to the shipping system either for determination purposes or for printing on a manifest. It should be noted that the computer processing means 50 and all of the components contained therein could be physically located in the shipping system 80 rather than with the dimensional weighing apparatus 10. It is only necessary for complete implementation of the present invention that the computer processing means 50 be operatively interconnected between the measuring frame 30 and the associated optical measuring means, on the one hand, and the shipping system 80 on the other, with the physical location of the computer processing means 50 being a matter of choice.

Detailed Description Text - DETX (19): The CPU 74 then performs two functions. It receives the linear dimensions from the memory storage unit 66 and calculates the actual volume of the carton. In the illustration given, this would equal 1344 cubic inches. The CPU then compares this volume against the threshold volume stored in the memory storage unit 50, and determines that it is considerably less than the threshold volume of 1728 cubic inches, which means that the shipping charge for the carton will automatically be based on the actual weight of the carton as determined by the scale 20, i.e., 10 pounds. A signal indicative of this determination is sent by the CPU 74 via the line 76 and 78 to the shipping system 80, which determines the appropriate shipping charge for the carton as described above and prints out a manifest of the charges for all cartons dimensionally measured during a predetermined period of time, and also prints individual address labels for each carton, typically with bar coded information thereon.

Detailed Description Text - DETX (20): If, on the other hand, a carton C is placed on the scale platform 24 which still weighs only 10 pounds, but the linear dimensions of this carton are, for example, 15 inches on the measuring arm 32, 23 inches on the measuring arm 34 and 11 inches on the measuring arm 36, the same procedure as described above would occur, except that the calculated volume of the carton would now be 3795 cubic inches, far in excess of the threshold volume of 1728 cubic inches. The CPU 74 responds to this situation by determining the dimensional weight of the carton, by dividing the calculated volume by the dimensional constant stored in the memory storage unit 53, which in the example is assumed to be the domestic shipping standard of 194 cubic inches per pound. The CPU 74 divides the calculated volume of 3795 cubic inches by 194, which equals 19.56 pounds, and then compares this weight to the actual weight of the carton as determined by the scale 20 to determine which weight is the larger. In the example given, since the dimensional weight of 19.56 pounds is the larger, the CPU sends a signal indicative of this weight via to the lines 76 and 78 to the shipping system 80, which then determines the shipping charge for 19.56 pounds in the same manner as it did for the smaller carton for which the actual weight was 10 pounds.

Detailed Description Text - DETX (21): If, on the other hand, the actual weight of this carton had been 25 pounds, the comparator 74 would determine that the actual weight is the larger, and would then send this weight to the shipping system 80 for determination

of the appropriate shipping charge. Thus, it will be seen that the apparatus 10 effectively converts the volume of a carton which is inordinately large in comparison to its actual weight into a dimensional weight which affords a realistic shipping charge when the dimensional weight is converted into the shipping charge.

Claims Text - CLTX (1): 1. Dimensional weighing apparatus adapted for use with a shipping system which determines an appropriate shipping charge for packages and parcels based on an appropriate shipping weight as determined by said dimensional weighing apparatus, said dimensional weighing apparatus comprising:

Claims Text - CLTX (8): (f) computer processing means responsive to operation of said weighing scale and said measuring means for determining a shipping weight of said carton by calculating the dimensional weight thereof and comparing said dimensional weight with said actual weight to determine which of said weights is the larger, whereby said dimensional weighing apparatus determines the appropriate shipping weight on which the shipping system determines an appropriate shipping charge.

PGPUB-DOCUMENT-NUMBER: 20020032613
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020032613 A1
TITLE: Methods and systems for the physical delivery of goods ordered through an electronic network
PUBLICATION-DATE: March 14, 2002
INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Buettgenbach, Thomas H.	San Diego	CA	US	
Sheehy, Finbar	San Diego	CA	US	

US-CL-CURRENT: 705/26

ABSTRACT: The present system relates to systems and methods for providing delivery of goods purchased through electronic commerce. An embodiment of the present invention allows a user to purchase an item from a vendor or merchant in an e-commerce environment and have the item shipped to a selected Will-Call Center for pick up by a recipient. The recipient can be the user or some other designated party. The Will-Call Center further automatically notifies the recipient of the availability of the item to be picked up.

---------- KWIC ---------

Summary of Invention Paragraph - BSTX (13): [0012] One embodiment further reserves space at the Will-Call Center for the arrival and the storage of the package. The vendor provides an estimate of a package size, and where applicable, a refrigeration requirement to the Will-Call Center. The Will-Call Center compares the storage requirements of the package to a database including an inventory of available physical spaces for at least the expected arrival date and/or time. Where adequate and appropriate storage space exists, the Will-Call Center indicates the presence of available space to the vendor, the vendor arranges for shipping to the Will-Call Center, and the Will-Call Center reserves an appropriate physical space for the package.

Detail Description Paragraph - DETX (46): [0073] There are many suitable locations for a Will-Call Center. For example, a Will-Call Center can be hosted by a contract provider of managed services at the employment site. The provider of services may host and operate the Will-Call Center independently or jointly with the employer. Examples of other appropriate services at a work site include foodservice providers with cafeterias, contract mailroom service providers, and contract copy service providers. A Will-Call Center may be located in a shopping mall optionally in conjunction with other retail stores and services such as convenience stores, dry cleaners, and gas stations. Naturally, a variety of goods and services may be offered at a Will-Call Center because a variety of goods are available over the Internet. Examples of goods and services available for purchase over the Internet at a Will-Call Center include books, clothing, computers, electronic equipment, groceries, household supplies, postage stamps, document printing such as checks, dispute resolution between parties such as vendors, buyers, recipients, and common carriers, and quality checks of

the condition of deliveries upon arrival. Other convenient locations for Will-Call Centers include apartment buildings, gated communities, and universities.

Detail Description Paragraph - DETX (76): [0103] In the second step 820, the process estimates a shipping charge and verifies an authorization of payment by a credit card company and issues an at least temporarily unique package identifier (id) to the user. The package id can include numerals, characters, and the like. In one embodiment, the credit card is not charged in the second step 820. Of course, where a vendor agrees to pay for shipping, the authorization of payment from the credit card company is not needed. The package id is provided to the user over a Web page or through another medium, such as an email message. Preferably, the user writes or attaches a label with the package id on a box or package that contains the item. The process advances from the second step 820 to a third step 830.

PGPUB-DOCUMENT-NUMBER: 20020107820
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020107820 A1
TITLE: Single courier model for the delivery of goods ordered by the internet
PUBLICATION-DATE: August 8, 2002
INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Huxter, Stephen	Mountain View	CA	US	

US-CL-CURRENT: 705/402, 705/26 , 705/28

ABSTRACT: Systems and methods to deliver goods ordered from e tailer to an automated collection point are described. The e tailer employs a single courier to deliver goods to automated collection points. Systems and methods are describe to select an automated collection point for delivering the goods. The system may segregate pending deliveries into groups, with each group of deliveries assigned to a distinct automated collection point. In embodiments of the invention, the groups are selected so that the customers corresponding to each group reside within the vicinity of the corresponding collection point. In embodiments of the invention, the customers receiving orders at an automated collection point may receive a discount for consolidating deliveries. In some embodiments, this may comprise a flat discount. In other embodiments, the discount may be applied on a pro-rata basis.

--------- KWIC ---------

Summary of Invention Paragraph - BSTX (6): [0006] Recently, a third approach to retailing has evolved: buying goods over the internet. Customers select their goods from the choice available on a vendor's web page. Payment is conducted typically with a credit card, which is authorized at the point of purchase. This retail approach is referred to as "etailing"; vendors using the etailing model are referred to as "etailers".

Detail Description Paragraph - DETX (87): [0147] In the context of this invention, an Etailer 700 is a company that sells products through an online medium rather than through a physical store. In an embodiment of the invention, there are two types of Etailers: registered and non-registered. Registered Etailers 700 have a relationship with the ACP network and integrate directly with the Application Server 1040; non-registered Etailers have no relationship with the ACP network.

Detail Description Paragraph - DETX (168): [0228] A process for calculating delivery fees is illustrated in FIG. 21. The package weight, size, and ship-from-address are determined from the e tailer 2008 server 2201. In embodiments of the invention, for each courier and each level of service available from that courier, a fee is determined 2205-2210. In some embodiments, all of this information is presented to the customer on the web browser 2010, so that the customer may select shipping options via a form on the browser 2010. In alternative embodiments, the cheapest rate for a desired service/address combination is selected 2212. Other alternative rate selection schemes facilitated by such embodiments will be apparent to those skilled in the art.

Detail Description Paragraph - DETX (172): [0232] In embodiments of the invention, the etailer 2008 does not carry stock. This situation is typical of many if not most e tailers in operation as of the time of this writing. Such a situation is illustrated in FIG. 25. In such circumstances, the e tailer 2008 locates, receives, and packages the goods to be distributed 2601. The order for the goods is received and a courier is identified 2603. A tracking number is generated according to rules specific to the courier and a label may be printed with an address for the collection point and/or a bar-code tracking number 2604. A locker at the collection point is reserved 2611 for delivery of the goods. FIG. 26 illustrates a settlement procedure employed for settling the transactions conducted with the e tailier. The procedure loops through multiple transactions 2702 2703, and sets the prices for each according to whether the scheduled shipping date agrees with the actual shipping date--this determines whether the consolidated shipping fee or the full price for the appropriate collection point is assessed 2707. FIG. 27 illustrates a process for setting the initial parameters for tabulating discounts. If dynamic fee calculation is available 2801, the appropriate binary parameter is set 2803, and the parameter initialization proceeds to determine if the consolidation discount is available 2804. If so, the appropriate binary parameter is set 2806, and the procedure determines whether pro-rata consolidation 2807 is available, and sets the appropriate binary parameter accordingly 2809.

Detail Description Paragraph - DETX (178): [0238] If a collection point address isn't entered 3104, which will be the normal situation for the majority of new customers who will simply put their own home address, then 3107 the courier's central server searches for a cookie on the customer's device which may contain collection point preferences. To use a collection point, customers are first registered and as part of the registration process any preferences they specify will be written to a cookie stored on their device. If default collection points are found within that cookie then the procedure 3110 determines if any of the collection points chosen can handle the package size.

	Type	L #	Hits	Search Text	DBs	Time Stamp
1	BRS	L1	28614	length near3 (height or thickness) near3 width	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	2005/02/04 14:02
2	BRS	L2	271651	(package or packaging or envelope or mailer or box or container) near5 (size or shape or volume or dimension or 1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	2005/02/04 14:03
3	BRS	L3	14042	2 near8 (estimate or estimated or estimating or estimation or predict or predicted or predicting or prediction or approximate or approximated or approximating or approximation or determine or determined or determining or determination or select or selected or selecting or selection or chose or choosing or chosen)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	2005/02/04 14:06
4	BRS	L4	91812	(postage or shipping or transport or transported or transporting or transportation or convey or conveying) near5 (cost or costing or price or pricing or rate or rating or fee or feeing or charge or charges or charging or bill or billing)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	2005/02/04 14:06

	Type	L #	Hits	Search Text	DBs	Time Stamp
5	BRS	L5	2559	4 near5 (estimate or estimated or estimating or estimation or predict or predicted or predicting or prediction or approximate or approximated or approximating or approximation or determine or determined or determining or determination)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	2005/02/04 14:07
6	BRS	L6	27216	(shop or shipping or buy or buying or purchase or purchased or purchasing or sell or selling or sold or auction or auctioned or auctioning) near3 (line or link or channel or internet or web or net or network or lan or wan or online or www)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	2005/02/04 14:07
7	BRS	L7	25	3 and 5 and 6 Scanned Ti, Ab, Kwic all	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	2005/02/04 14:10
8	BRS	L8	10	(@pd<="19710101" not @pd<="19470101") and (705/26 or 705/27 or 705/401 or 705/402 or 705/407).ccls. Scanned Ti all	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	2005/02/04 14:27

	Document ID	Issue Date	Inventor	Current OR	Current XRef	Pages
1	US 5914463 A	19990622	Dlugos; Daniel F.	177/25.11	177/25.12; 177/25.15; 177/4	16
2	US 5793652 A	19980811	DeBarber; Christopher et al.	702/173	702/156; 705/401; 705/407	15
3	US 5331118 A	19940719	Jensen; Soren	177/25.14	177/245; 33/1V; 33/121; 702/166; 702/170	9
4	US 20020107820 A1	20020808	Huxter, Stephen	705/402	705/26; 705/28	64
5	US 20020032613 A1	20020314	Buettgenbach, Thomas H. et al.	705/26		28

L7 results